

Remarks

Claims 1-9, 11-24 and 26 remain.

Claim 6 has been amended to overcome the claim objection stated in paragraph 1 of the Office Action. The rejection of claim 11 under Section 112 as stated in paragraphs 2-3 of the Office Action is obviated because claim 1 has been amended to include "antiferromagnetic material".

Claims 1-9 and 11-24 have been rejected under Sections 102(e) and/or 103(a) as anticipated by and/or in view of one or more of US2002/0028356 (Kawato et al.), US2002/0028357 (Shukh et al.) and US2002/0127433 (Shimizu et al.).

The Examiner has indicated that claims 10-11 and 25-26 would be allowable if amended to be in independent form because both Kawato and Shukh "fail to teach or suggest the use of an antiferromagnetic layer in between the multilayer underlayer structure and the substrate." However, Shukh does indeed teach, but does not claim, such an antiferromagnetic layer at the second column of page 4, lines 12-17.

Attached to this amendment is a declaration by all inventors under Rule 131 establishing a date of invention prior to August 25, 2000, which is the earliest effective filing date of Shukh for purposes of Section 102(e). This declaration also establishes a date of invention prior to the earliest effective filing date of both Kawato and Shimizu for purposes of Section 102(e).

In view of the attached declaration, Shukh is not available as a Section 102(e) reference and the Examiner's indicated allowability of claims 10-11 and 25-26 if amended to be in independent form is appropriate.

Independent claim 1 has been amended to include the limitation of claim 10 and independent claim 15 has been amended to include the limitation of claim 25. Claim 26 has been amended to now depend from claim 15. Thus all remaining claims are believed in condition for allowance.

The Examiner is invited to call Applicants' attorney if a telephone conference will expedite the prosecution of the application.

Respectfully submitted,

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AMENDED CLAIMS WITH MARKINGS TO SHOW CHANGES MADE

1. (*Amended*) A perpendicular magnetic recording disk comprising:

a substrate;

a laminated underlayer on the substrate, the underlayer comprising a laminate of first and second ferromagnetic layers and a nonferromagnetic spacer layer between and in contact with the two ferromagnetic layers, the two ferromagnetic layers being exchange coupled antiferromagnetically across the spacer layer, whereby the magnetic moments of the two ferromagnetic layers are antiparallel; [and]

a layer of antiferromagnetic material between the first ferromagnetic layer and the substrate for pinning the magnetic moment of the first ferromagnetic layer in a preferred direction; and

a magnetic recording layer of material having perpendicular magnetic anisotropy on the laminated underlayer.

6. (*Amended*) The disk of claim [6] 5 wherein the cobalt-iron alloy includes an element selected from the group consisting of nickel, boron and copper.

15. (*Amended*) A perpendicular magnetic recording disk having a generally circular shape and comprising:

a substrate;

a layer of antiferromagnetic material on the substrate;

a laminated underlayer on the [substrate] layer of antiferromagnetic material, the underlayer comprising N ferromagnetic layers and N-1 nonferromagnetic spacer layers, wherein N is greater than or equal to 2, each of the spacer layers being located between and in contact with two adjacent ferromagnetic layers [and having a thickness sufficient to induce antiferromagnetic exchange coupling across said adjacent ferromagnetic layers], a first of the N ferromagnetic layers being located on and in contact with the layer of antiferromagnetic material and having its magnetic moment pinned in a generally radial direction by being exchange biased with said antiferromagnetic material, each of the spacer layers having a thickness sufficient to induce antiferromagnetic exchange coupling across said adjacent ferromagnetic layers, whereby the magnetic moments of adjacent ferromagnetic layers are oriented generally antiparallel in the absence of an applied magnetic field, said magnetic moments being aligned in generally radial direction on the disk in the absence of an applied magnetic field; and

a magnetic recording layer of material having perpendicular magnetic anisotropy on the laminated underlayer.

26. (*Amended*) The disk of claim [25] 15 wherein the antiferromagnetic material is a material selected from the group consisting of FeMn, NiMn, PtMn, IrMn, PdPtMn and NiO.